

Notice of Allowability

Application No.

10/043,723

Examiner

Jennifer M. Dolan

Applicant(s)

MAEKAWA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the 11/10/03 Amdt.
2. ☒ The allowed claim(s) is/are 52-58; 71-74.
3. ☒ The drawings filed on 08 March 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**


7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____. |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____. | 6 <input type="checkbox"/> Examiner's Amendment/Comment |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

Allowable Subject Matter

1. Claims 52-58 and 71-74 are allowed.
2. The following is an examiner's statement of reasons for allowance: The primary reason for allowance is the inclusion of an insulator film deposited between an amorphous silicon layer and a transition metal layer, the insulator film dimensioned appropriately such that the amorphous film can be doped with transition metal nuclei through the insulating film. The examiner notes that the product-by-process limitations in the independent claims are only given weight to the extent that they affect the final product; nevertheless, it is clear that the claims require a TFT structure having a silicon film comprising amorphous silicon regions and transition metal-doped single-grain regions, a thin insulating layer directly covering at least the single-grain regions, such that doping could occur through the insulating layer, and a transition metal layer directly on top of the insulating layer.

The prior art teaches two general configurations: placing the transition metal directly on the amorphous silicon layer, and then recrystallizing; and forming an insulating layer on the amorphous layer, forming a window completely through the insulating layer, and then forming a transition metal layer upon the insulating layer, such that doping occurs through the window, where the transition metal directly touches the amorphous silicon film. There is no suggestion in the prior art that it would in any way be advantageous or facilitate the formation of single grain material to position an insulating layer such that the transition metal must diffuse through the insulating material. Since the present invention uses the insulating layer for the specific purpose

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of controlling the transition metal doping, and since it is generally difficult to obtain large single-grain regions from transition metal doping, it is the examiner's opinion that the inclusion of a thin insulating layer would not have been obvious to one skilled in the art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,162,667 to Funai et al. discloses diffusion of a transition metal into an amorphous silicon layer through a thin insulating film. There is no suggestion, however, that such a process leads to the production of large single grain regions or that an insulating layer would be advantageous to use with a transition metal, as opposed to a metal containing solvent, as in Funai. Additionally, as Funai et al does not constitute valid prior art under 35 U.S.C. 103 (a) based upon 102 (e), due to the common assignee.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (703) 305-3233

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until 2/9/04, and (571) 272-1690 thereafter. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (703) 308-4940. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jennifer M. Dolan
Examiner
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jmd